

IN THE CLAIMS

Please amend the claims as described below. In accordance with 37 CFR §1.121, a complete listing of all claims in the application is provided below. Notably, the status of each claim is indicated in the parenthetical expression adjacent to the corresponding claim number.

Claims 1 - 50 (**canceled**).

1 Claim 51 (**new**): An EIW unit for use in sensing a process parameter of a
2 process to manufacture an integrated circuit using integrated circuit processing equipment,
3 the EIW unit comprising:
4 a substrate having a wafer-shaped profile;
5 a plurality of light sources, disposed on or in the substrate, to sample a process
6 parameter of the process performed by the integrated circuit processing equipment; and
7 a predetermined surface layer disposed above the plurality of light sources and
8 capable of receiving a surface structure thereon, wherein the surface structure is formed by
9 the integrated circuit processing equipment during processing.

1 Claim 52 (**new**): The EIW unit of claim 51 wherein the predetermined surface
2 layer is patterned to guide or shape the light output by the plurality of light sources.

1 Claim 53 (**new**): The EIW unit of claim 51 wherein the predetermined surface
2 layer includes a grating structure.

1 Claim 54 (**new**): The EIW unit of claim 53 wherein the refractive index of the
2 grating structure is capable of being changed dynamically.

1 Claim 55 (**new**): The EIW unit of claim 51 wherein the EIW unit further includes
2 an acoustic modulation module disposed in or on the substrate to control the refractive
3 index of the grating structure.

1 Claim 56 (**new**): The EIW unit of claim 51 wherein the plurality of light sources
2 operates in an end-point mode.

1 Claim 57 (**new**): The EIW unit of claim 51 wherein the plurality of light sources
2 operates in a real-time mode.

1 Claim 58 (**new**): The EIW unit of claim 51 wherein predetermined surface layer
2 includes a plurality of layers.

1 Claim 59 (**new**): The EIW unit of claim 58 wherein the plurality of layers is
2 comprised of a composite dielectric structure.

1 Claim 60 (**new**): The EIW unit of claim 51 wherein the plurality of light sources
2 output light at different wavelengths.

1 Claim 61 (**new**): The EIW unit of claim 60 further including a plurality of light
2 sensors, disposed in or on the substrate wherein the light sensors sample light that is
3 reflected or scattered by the surface structure formed by the integrated circuit processing
4 equipment during processing.

1 Claim 62 (**new**): The EIW unit of claim 51 wherein the intensity of the light output
2 by the plurality of light sources may be varied or modulated.

1 Claim 63 (**new**): The EIW unit of claim 51 wherein the intensity of the light output
2 of a first light source of the plurality of light sources may be varied or modulated relative to
3 another light source of the plurality of light sources.

1 Claim 64 (**new**): The EIW unit of claim 51 wherein the plurality of light sources is
2 VCSELs or LEDs.

1 Claim 65 (**new**): The EIW unit of claim 51 further including a plurality of light
2 sensors, disposed in or on the substrate, wherein the light sensors sample light that is
3 reflected or scattered by the surface structure.

1 Claim 66 (**new**): The EIW unit of claim 65 wherein the plurality of light sensors
2 are CMOS devices, charge coupled devices, or photodiodes.

1 Claim 67 (**new**): The EIW unit of claim 65 wherein the plurality of light sensors
2 periodically or continuously sample the intensity of the light while the EIW unit is disposed
3 in the integrated circuit processing equipment and undergoing processing.

1 Claim 68 (**new**): The EIW unit of claim 67 further including data storage, coupled
2 to the plurality of light sensors, to store data which is representative of the parameter.

1 Claim 69 (**new**): The EIW unit of claim 67 further including:
2 communication circuitry to provide the data which is representative of the parameter
3 to external circuitry; and
4 at least one rechargeable battery, to provide electrical power to the communication
5 circuitry.

1 Claim 70 (**new**): The EIW unit of claim 67 wherein the plurality of light sensors
2 sample the intensity of reflected or scattered light.

1 Claim 71 (**new**): A method of measuring a process parameter of an integrated
2 circuit manufacturing process using an EIW unit having a substrate, which includes a wafer-
3 shaped profile, a plurality of light sources disposed on or in the substrate, and a
4 predetermined surface layer disposed above the plurality of light sources, the method
5 comprising:

6 placing the substrate into the integrated circuit processing equipment;
7 performing the integrated circuit manufacturing process wherein a surface structure

8 forms on or in the predetermined surface layer during the manufacturing process;
9 enabling the plurality of light sources to output light;
10 sampling the response to the light output by the plurality of light sources; and
11 determining the process parameter using the sampled response.

1 Claim 72 (**new**): The method of claim 71 further including changing the refractive
2 index of the predetermined surface layer.

1 Claim 73 (**new**): The method of claim 71 further including dynamically changing
2 the refractive index of the predetermined surface layer while performing the integrated
3 circuit manufacturing process.

1 Claim 74 (**new**): The method of claim 71 wherein the response to the light output
2 by the plurality of light sources is sampled after performing the integrated circuit
3 manufacturing process.

1 Claim 75 (**new**): The method of claim 71 wherein the response to the light output
2 by the plurality of light sources is sampled while performing the integrated circuit
3 manufacturing process.

1 Claim 76 (**new**): The method of claim 71 wherein the plurality of light sources
2 output light at different wavelengths.

1 Claim 77 (**new**): The method of claim 71 wherein the EIW unit further includes a
2 plurality of light sensors, disposed in or on the substrate, and wherein the plurality of light
3 sensors sample the response to the light output by the plurality of light sources.

1 Claim 78 (**new**): The method of claim 71 further including sampling the response
2 to the light output by the plurality of light sources includes sampling the light that is reflected
3 or scattered by the surface structure formed by the integrated circuit processing equipment
4 during processing.

1 Claim 79 (**new**): The method of claim 71 further including varying the intensity of
2 the light output by the plurality of light sources.

1 Claim 80 (**new**): The method of claim 71 further including varying the intensity of
2 the light output of a first light source of the plurality of light sources relative to another light
3 source of the plurality of light sources.

1 Claim 81 (**new**): The method of claim 71 wherein the EIW unit further includes a
2 plurality of light sensors, disposed in or on the substrate, and wherein the plurality of light
3 sensors periodically or continuously sample the response to the light output by the plurality
4 of light sources while performing the integrated circuit manufacturing process.

1 Claim 82 (**new**): The method of claim 81 wherein the EIW unit further includes a
2 data storage, disposed in or on the substrate, and wherein the method further includes
3 storing the response to the light output by the plurality of light sources in the data storage.

1 Claim 83 (**new**): The method of claim 81 wherein the EIW unit further includes
2 communication circuitry, disposed in or on the substrate, and wherein the method further
3 includes communicating the response to the light output by the plurality of light sources.

1 Claim 84 (**new**): The method of claim 71 further including sampling the intensity
2 of the reflected or scattered light using a plurality of light sensors.

1 Claim 85 (**new**): The method of claim 84 wherein the plurality of light sensors is
2 disposed on or in the substrate of the EIW unit.

1 Claim 86 (**new**): The method of claim 85 further including varying the intensity of
2 the light output by the plurality of light sources.

1 Claim 87 (**new**): The method of claim 85 further including varying the intensity of
2 the light output of a first light source of the plurality of light sources relative to another light
3 source of the plurality of light sources.

1 Claim 88 (**new**): The method of claim 85 further including periodically or
2 continuously sampling the response to the light output by the plurality of light sources while
3 performing the integrated circuit manufacturing process.

1 Claim 89 (**new**): The method of claim 85 further including sampling the response
2 to the light output by the plurality of light sources after performing the integrated circuit
3 manufacturing process.

1 Claim 90 (**new**): The method of claim 85 further including changing the refractive
2 index of the predetermined surface layer.

1 Claim 91 (**new**): The method of claim 85 further including dynamically changing
2 the refractive index of the predetermined surface layer while performing the integrated
3 circuit manufacturing process.

1 Claim 92 (**new**): The method of claim 71 wherein the process parameter is a
2 thickness of the surface structure.

1 Claim 93 (**new**): The method of claim 71 wherein the process parameter is a
2 spatial distribution of a surface structure.

1 Claim 94 (**new**): A system for sensing process parameters of a process for
2 manufacturing an integrated circuit using integrated circuit processing equipment, the

3 system comprising:
4 an EIW unit, including:
5 substrate having a wafer-shaped profile; and
6 a source, disposed on or in the substrate, to output interrogation signals;
7 a sensor to sample the interrogation signals while or after the EIW unit is subjected
8 to processing by the integrated circuit processing equipment; and
9 a computing device to receive the sampled interrogation signals from the sensor and
10 determine the process parameter using the sampled interrogation signals.

1 Claim 95 (**new**): The system of claim 94 wherein the source is a VCSEL or LED.

1 Claim 96 (**new**): The system of claim 95 wherein the sensor is a CMOS device,
2 charge coupled device, or photodiode.

1 Claim 97 (**new**): The system of claim 94 wherein the process parameter is the
2 surface profile.

1 Claim 98 (**new**): The system of claim 94 wherein the sensor is disposed on or in
2 the substrate.

1 Claim 99 (**new**): The system of claim 98 further including communications
2 circuitry disposed on the substrate, wherein the communications circuitry is coupled to the
3 sensor to provide the sampled interrogation signals to the computing device.

1 Claim 100 (**new**): The system of claim 94 wherein the sensor operates in an end-
2 point mode.

1 Claim 101 (**new**): The system of claim 94 wherein the sensor operates in a real-
2 time mode.

1 Claim 102 (**new**): The system of claim 94 wherein the EIW unit further includes a
2 predetermined surface layer disposed above the source, and wherein the source is a
3 plurality of light sources that output light at different wavelengths.

1 Claim 103 (**new**): The system of claim 102 wherein the sensor is a plurality of light
2 sensors wherein the light sensors sample light that is reflected or scattered by a surface
3 structure formed by the integrated circuit processing equipment during processing.

1 Claim 104 (**new**): The system of claim 103 wherein the plurality of light sensors is
2 disposed in or on the substrate.

1 Claim 105 (**new**): The system of claim 103 wherein the predetermined surface
2 layer is patterned to guide or shape the light output by the plurality of light sources.

1 Claim 106 (**new**): The system of claim 103 wherein the predetermined surface
2 layer includes a grating structure.

1 Claim 107 (**new**): The system of claim 106 wherein the refractive index of the
2 grating structure is capable of being changed dynamically.

3 Claim 108 (**new**): The system of claim 106 wherein the EIW unit further includes
4 an acoustic modulation module disposed in or on the substrate to control the refractive
5 index of the grating structure.

1 Claim 109 (**new**): The system of claim 102 wherein the sensor and source operate
2 in an end-point mode.

1 Claim 110 (**new**): The system of claim 102 wherein the sensor and source operate
2 in a real-time mode.

1 Claim 111 (**new**): The system of claim 102 wherein predetermined surface layer
2 includes a plurality of layers.

1 Claim 112 (**new**): The system of claim 102 wherein the plurality of layers is
2 comprised of a composite dielectric structure.

1 Claim 113 (**new**): The system of claim 102 wherein the intensity of the light output
2 by the plurality of light sources may be varied or modulated.

1 Claim 114 (**new**): The system of claim 102 wherein the intensity of the light output
2 of a first light source of the plurality of light sources may be varied or modulated relative to
3 another light source of the plurality of light sources.

1 Claim 115 (**new**): The system of claim 94 wherein the computing device
2 determines the thickness of a surface layer formed by the integrated circuit processing
3 equipment during processing.

1 Claim 116 (**new**): The system of claim 94 wherein the computing device
2 determines the spatial distribution of a surface layer formed by the integrated circuit
3 processing equipment during processing.